

CLAIMS

What is claimed is:

1. A method for preparing a functionalized polymer, the method comprising:
contacting an anionically-polymerized living polymer with an
5 isocyanato alkoxysilane or isothiocyanato alkoxysilane.
2. The method of claim 1, where the anionically-polymerized polymer is a prepared from at least one monomer comprising 1,3-butadiene, isoprene, 1,3-pentadiene, 2,3-dimethyl-1,3-butadiene, 1,3-hexadiene, myrcene, styrene, α -methyl styrene, *p*-methylstyrene, and vinylnaphthalene.
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3. The method of claim 1, where the anionically-polymerized polymer is a copolymer of styrene and 1,3-butadiene.
- 15 4. The method of claim 1, vulcanizate of claim 2, where the anionically-polymerized polymer is formed by using an initiator comprising at least one element from Group 1 or Group 2 of the Periodic Table.
- 20 5. The method of claim 1, where the anionically-polymerized polymer is contacted with from about 0.3 to about 1 equivalent of terminating agent per equivalent of initiator.
- 25 6. The method of claim 4, where the initiator includes a lithium-containing initiator.
7. The method of claim 3, where the anionically-polymerized polymer is formed by using a lithium-containing initiator in the presence of a polar coordinator.
- 30 8. The method of claim 7, where the anionically-polymerized polymer includes from about 10 to about 50 percent *mer* units deriving from styrene, and where from about 8 to about 99 percent of the *mer* units deriving from 1,3-butadiene are in the 1,2-vinyl microstructure.

9. The method of claim 8, where the anionically-polymerized polymer includes from about 18 to about 40 percent *mer* units deriving from styrene, and where from about 10 to about 60 percent of the *mer* units deriving from 1,3-butadiene are in the 1,2-vinyl microstructure.

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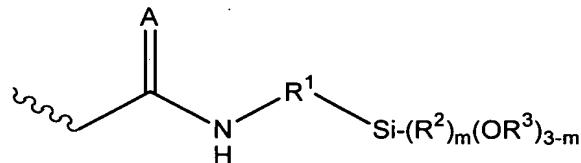
10. The method of claim 9, where the remaining *mer* units deriving from 1,3-butadiene are in the 1,4-cis microstructure or the 1,4-trans microstructure at a relative ratio of about 3 cis-units to about 5 trans-units.

10 11. The method of claim 1, where the isocyanato alkoxysilane compound or isothiocyanato alkoxysilane compound comprises gamma-isocyanatopropyl-triethoxysilane, gamma-isothiocyanatopropyl-triethoxysilane, gamma-isocyanatopropyl-trimethoxysilane, and gamma-isothiocyanatopropyl-trimethoxysilane.

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12. The method of claim 1, where the isocyanato alkoxysilane comprises gamma-isocyanatopropyl-trimethoxysilane.

13. A functionalized polymer that is defined by the formula



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where ~~~~ is an anionically-polymerized polymer, A is oxygen or sulfur, R¹ is a divalent organic group, each R² and R³ is a monovalent organic group, and m is an integer from 0 to 2.

25 14. The functionalized polymer of claim 13, where the anionically-polymerized polymer is a copolymer of styrene and 1,3-butadiene.

15. The functionalized polymer of claim 13, where the anionically-polymerized polymer is contacted with from about 0.3 to about 1 equivalent of terminating agent per equivalent of initiator.

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16. The functionalized polymer of claim 14, where the anionically-polymerized polymer is formed by using a lithium-containing initiator in the presence of a polar coordinator.

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17. The functionalized polymer of claim 16, where the anionically-polymerized polymer includes from about 10 to about 50 percent *mer* units deriving from styrene, and where from about 8 to about 99 percent of the *mer* units deriving from 1,3-butadiene are in the 1,2-vinyl microstructure.

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18. The functionalized polymer of claim 17, where the anionically-polymerized polymer includes from about 18 to about 40 percent *mer* units deriving from styrene, and where from about 10 to about 60 percent of the *mer* units deriving from 1,3-butadiene are in the 1,2-vinyl microstructure.

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19. The functionalized polymer of claim 18, where the remaining *mer* units deriving from 1,3-butadiene are in the 1,4-cis microstructure or the 1,4-trans microstructure at a relative ratio of about 3 cis-units to about 5 trans-units.

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20. A vulcanizate prepared by employing the functionalized polymer of claim 11, and further comprising carbon black, silica, or a mixture thereof.